PHRONIMIDAE (CRUSTACEA: AMPHIPODA: HYPERIIDEA) OF THE EASTERN PACIFIC

A total of 466 samples of phronimids collected from the upper 200m layer of the eastern equatorial Pacific (20°N–20°S and E of 126°W) and coastal waters of California (33–35°N and E of 122°W) were examined. All species of the Phronimidae were found in the eastern equatorial Pacific where *Phronima dunbari* Shih (1991) and *P. bowmani* Shih (1991)(formerly E. Pacific Form of *P. stebbingi* and *P. colletti* respectively [Shih, 1969]) dominated. Only *P. sedentaria* (Forskål, 1775), *P. atlantica* Guérin, 1836, and *P. stebbingi* Vosseler, 1900, occurred in the coastal waters of California.

The sympatric distribution of morphologically similar species pairs (analogous species, Shih, 1986a) is common in the eastern equatorial Pacific, e.g. *Phronima stebbingi-P. dunbari* and *P. colletti-P. bowmani* of the present study, and there are examples of chaetognaths, euphausiids and copepods in the literature. This plankton distribution pattern is probably related to the complex oceanic circulation of the area where six currents converge or diverge (Wyrtki, 1967).

Eddies from main oceanic currents bring enclosed water from one water mass to a new environment surrounded by another water mass. The best known examples are cold core rings of the Gulf Stream (The Ring Group, 1981). The entrained plankton population is subjected to continuous decay of the core water due to increasing dilution by water of the surrounding environment and is under tremendous physiological stress (Boyd *et al.*, 1978; Wiebe and Boyd, 1978). Populations of planktonic species are known to be different in genetic structure (Bucklin and Marcus, 1985) and to be distributed patchily (Wiebe, 1970). Unusual environmental stress may affect the genetic structure of a population: some copepod species in the eastern equatorial Pacific exhibit higher genetic heterogeneity than those in the equatorial and tropical central Pacific (Afnas'yev *et al.*, 1989).

The oceanic condition in the eastern equatorial Pacific, the general knowledge of oceanic eddies, the biology of a population entrained in an eddy, and diversification of genetic structure in plankton, strongly support the hypothesis of planktopatric speciation in marine zooplankton (Shih, 1986): 1. entrained population is subject to a different set of biotic and abiotic stresses; 2. modification of genetic structure occurs in a segment of the entrained population as a result of adaptation to new environmental stress; 3. successful propagation of the genetically modified segment of population leads to formation of a new taxon following succeeding reproductive isolation.

Thus planktopatric speciation probably is the answer to why there are so many analogous plankton species in the eastern equatorial Pacific.

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